REMARKS

The claims currently pending in this application are Claims 1-5, with Claims 1 and 4 being the only independent claims.

Appreciation is expressed to Examiner Williams for the indication that Claim 3 would be allowable if rewritten in independent form.

The subject matter of this application pertains to a master cylinder with a braking stroke simulator. As recited in independent Claim 1, the master cylinder with braking stroke simulator comprise a master piston slidably accommodated in a housing, a simulator piston slidably accommodated in the housing, an elastic member, and a cut-off seal member disposed in the housing. An atmospheric pressure chamber is defined in the housing to store brake fluid under atmospheric pressure and a master pressure chamber is defined in front of the master piston to generate a hydraulic braking pressure. The simulator piston that is slidably accommodated in the housing defines a simulator chamber in front of the simulator piston, and moves back and forth in response to operation of the manually operated braking member. The elastic member applies the stroke of the simulator piston in response to braking operation force applied to the manually operated braking member, and provides together with the simulator piston the braking stroke simulator. The braking stroke simulator transmits the braking operation force of the manually operated braking member to the master piston through the simulator piston and the elastic member. The cut-off seal member slidably supports the master piston in the housing in a fluid-tight manner. The cut-off seal member is positioned to be applied with the pressure in the master pressure chamber in front of the cut-off seal member and with the pressure in the atmospheric pressure chamber behind the

cut-off seal member. In addition, a passage is formed in the master piston to communicate the simulator chamber with the atmospheric pressure chamber when the master piston is placed in an initial position. The cut-off seal member is positioned relative to this passage in the master piston to block communication between the simulator chamber and the atmospheric pressure chamber when the master piston is advanced by a predetermined stroke (or more) from the initial position.

The Official Action sets forth a rejection of independent Claim 1, as well as independent Claim 5, based on the disclosure contained in U.S. Patent No. 6,183,049 to *Oka et al.* That rejection is respectfully traversed for at least the following reasons.

Oka et al. discloses a brake boosting system that is specifically designed to directly boost the master cylinder pressure to provide an intensified braking force. The disclosed brake boosting system includes a vacuum booster 2 which boosts the force applied to a brake pedal, a master cylinder 3 actuated by the output of the vacuum booster 2, and wheel cylinders 4, 5, 6, 7 connected to the master cylinder 3. The vacuum booster 2 includes an output shaft 11 which outputs the boosted pressure produced by the vacuum booster 2. The master cylinder includes a housing within which is slidably positioned a primary piston 12 and a secondary piston 13. The front end portion of the output shaft 11 of the vacuum booster 2 is positioned in an axial hole 27 formed in the primary piston 12. A pair of cup sealing members 30, 31 are positioned in the axial hole 27 of the primary piston 12 and engage the front end portion of the output shaft 11 of the vacuum booster 2. A return spring 35 is disposed between the vacuum booster output shaft 11 and the

primary piston 12. An annular fluid chamber 22, connected to a reservoir 9, is provided between the inside surface of the housing 14 and the outside surface of the primary piston 12, and is sealed at axial ends by cup sealing members 17, 18. Another fluid chamber 23 is defined between the primary and secondary pistons 12, 13 and is sealed at axial ends by cup sealing members 18, 19. A radial hole 36 formed in the primary piston 12 permits communication between the two fluid chambers 22, 23. As the primary piston 12 is moved, the radial hole 36 passes over the cup sealing member 18 to prevent communication between the fluid chambers 22, 23. A further fluid chamber 32 is defined between the front end portion of the vacuum booster output shaft 11 and the hole 27 in the primary piston 12, and is sealed at axial ends by cup sealing members 30, 31. This fluid chamber 32 is capable of communicating with the fluid chamber 22 by way of a passage 37 formed in the primary piston 12.

The Official Action observes that the brake boosting system disclosed in *Oka et al.* includes a stroke simulator. In this regard, the Official Action note that the output shaft 11 disclosed in *Oka et al.* corresponds to the claimed simulator piston, the spring 35 disclosed in *Oka et al.* corresponds to the claimed elastic member, and the pressure chamber 33 corresponds to the claimed simulator chamber positioned in front of the simulator piston. However, as generally discussed above, the feature identified by reference numeral "11" in *Oka et al.* is not a simulator piston forming part of a braking stroke simulator, but rather is the output shaft of the vacuum booster 2. Further, the feature by reference numeral "33" in *Oka et al.* is a reaction chamber while the feature identified by reference numeral "35" in *Oka et al.* is a return spring. *Oka et al.* specifically describes in lines 18-21 of column 6 that the

return spring which is compressed and disposed between the vacuum booster output shaft 11 and the primary piston 12 possesses a spring constant smaller than the return spring 28 which biases the primary piston 12.

It is thus apparent that the output shaft 11 of the vacuum booster, the reaction chamber 33 and the return spring 35 do not form a braking stroke simulator. This conclusion is further supported by other portions of the disclosure in *Oka et al.*

Oka et al. describes in the fourth full paragraph of column 6 that the passage 37 in the primary piston 12 always allows communication between the annular fluid chamber 22 and the annular fluid chamber 32. Near the top of column 8, *Oka et al.* describes that a normally closed solenoid shut-off valve 75 is disposed on the line 74 connecting the pressure intensifying chamber 31 of the master cylinder 3 and the circular line 49 at a position downstream of the check valve 51. In the middle portion of column 8, *Oka et al.* describes that during operation of the brake pedal to perform normal braking operation, the vacuum booster 2 is actuated to advance the output shaft 11 so that the output shaft 11 contacts the primary piston 12 to transmit the boosted power produced by the vacuum booster to the primary piston 12. As the output shaft 11 moves towards the primary piston 12, the radial hole 38 in the output shaft 11 moves past the cup sealing member 31 to seal off the reaction chamber 33 and the pressure intensifying chamber 21 from the reservoir 9. The movement of the primary piston 12 operated by the output from the vacuum booster 2 causes the radial hole 36 in the primary piston 12 to move past the cup sealing member 18 to shut off the fluid pressure chamber 23 from the reservoir 9. Further movement of the piston 12 results in development of a master cylinder pressure in the fluid pressure chamber 23. Further, as discussed near the top of column 9 of *Oka et al.*, upon

release of the brake pedal, the operation of the vacuum booster 2 ceases and the output shaft 11 moves back towards its inoperative position. At this time, only the output shaft 11 moves because the reaction chamber 33 and the pressure intensifying chamber 21 are both shut off from the reservoir 9 until the radial hole 38 in the output shaft 11 moves past cup sealing member 31. Once the cup sealing member 38 moves past the cup sealing member 31, the reaction chamber 33 and the pressure intensifying chamber 21 communicate with the reservoir 9, so that the brake fluid in the chambers 33, 21 is discharged to the reservoir 9. The primary piston 12 is thus allowed to move back towards it initial inoperative position. *Oka et al.* further describes in the middle portion of column 9 that if the brake pedal is operated with a pedal stroke higher than that applied during normal braking, an electronic control unit determines the need for braking assist control. The electronic control unit then drives the motor 52 to actuate a pump 53 and switches a solenoid valve 72 to a communication position while also opening a solenoid shut-off valve 75. The pump discharge pressure in the reaction chamber 33 causes the output shaft 11 to be pushed back and stopped at a position where the force produced by the fluid pressure in the reaction chamber 33 acting on the output shaft and the output of the output shaft 11 are balanced.

It is thus apparent that the vacuum booster output shaft 11 and the elastic member 35 do not form a braking stroke simulator which transmits the braking operation force of a manually operated braking member to the primary piston 12 through the output shaft 11 and the elastic member 35 as recited in independent Claim 1. It is further apparent that the reaction chamber 33 disclosed in *Oka et al.* is not a simulator chamber.

The Official Action also observes that the cup sealing member 18 disclosed in *Oka et al.* corresponds to the claimed cut-off seal member recited in independent Claim 1, while the passage 37 formed in the primary piston disclosed in *Oka et al.* corresponds to the claimed passage recited in independent Claim 1. However, Claim 1 recites that the cut-off seal member is positioned relative to the passage formed in the master piston to block communication between the simulator chamber and the atmosphere pressure chamber when the master piston is advanced by a predetermined stroke (or more) from the initial position. There is no disclosure in *Oka et al.* that the disclosed brake boosting system is designed to advance the primary piston to such an extent that the cup sealing member 18 blocks communication between the reaction chamber 33 (simulator chamber) and the pressure chamber 22 (atmospheric pressure chamber) when the primary piston is advanced by a predetermined stroke (or more) from its initial position. Such an arrangement of the cup sealing member 18 and the passage 37 is not consistent with the disclosure in *Oka et al.* Indeed, as mentioned above, *Oka et al.* describes in the fourth full paragraph of column 6 that the passage 37 in the primary piston 12 always allows communication between the annular fluid chamber 22 and the annular fluid chamber 32.

For at least the reasons set forth above, it is respectfully submitted that the claimed master cylinder and braking stroke simulator recited in independent Claim 1, and dependent Claims 2 and 3, is patentably distinguishable over the disclosure contained in *Oka et al.*

Independent Claim 4 is patentably distinguishable over the disclosure in *Oka et al.* for similar reasons, it being noted that Claim 4 recites both the first passage

that is formed in the master piston to communication the master pressure chamber with the atmospheric pressure chamber when the master piston is in the initial position, and the second passage formed in the master piston to communicate the simulator chamber with the atmospheric pressure chamber when the master piston is in its initial position. The arguments presented above regarding the Claim 1 recitation of the passage and the cut-off seal member being positioned relative to the passage to block communication between the simulator chamber and the atmospheric pressure chamber apply equally to the recitation in independent Claim 4 of the cut-off seal member and the second passage.

It is thus respectfully submitted that Claim 4 and dependent Claim 5 are also allowable.

In light of the foregoing, withdrawal of the rejection of record and allowance of this application are earnestly solicited.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: June 15, 2005

By: Matthew L Schneider
Matthew L. Schneider
Registration No. 32,814

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-662